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Randomised Controlled Study Comparing Two Psychological Therapies for Posttraumatic Stress Disorder (PTSD): Emotional Freedom Techniques (EFT) Vs. Narrative Exposure Therapy (NET)

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Abstract

Background: Post-Traumatic Stress Disorder (PTSD) is a common psychological reaction after traumatic events. The aim of this study was to evaluate the efficacy of Emotional Freedom Techniques (EFT) and Narrative Exposure Therapy (NET) as treatments for PTSD with traumatised people.

Methods: A randomized controlled trial design was used. Sixty Iraqi students were selected who met the DSM-IV PTSD criteria. Participants were male students who were aged between 16-19 years. Participants were randomly divided into three groups, with 20 participants in each group. Those in the EFT and NET groups received 4 therapy sessions, while the control group received no treatment. One person from the NET group withdrew. All participants were assessed on PTSD symptoms, anxiety and depression, social support

Results: The results showed that the participants who received EFT reported a significant difference in all PTSD cluster at pre-test and post-test from T1 to T2 ($p > 0.05$). However, although the NET group reported a significant difference between pre-test and post-test in avoidance and re-experience, no significant difference was found in hyper arousal ($p < 0.05$). However, no significant differences were found in the experiential group with social support, coping strategies, and religious coping ($p < 0.05$).

These changes of PTSD, PTSD clusters, anxiety and depression remained stable for 3, 6 and 12 month follow-ups in EFT group, while these changes were unstable during the follow-ups. Measures of coping strategies showed that seeking support and active coping improved since the interventions. In conclusion, both EFT and NET showed their effectiveness among traumatised Iraqi people.

Keywords: EFT; NET; PTSD

Abbreviations: EFT: Emotional Freedom Techniques; NET: Narrative Exposure Therapy; PTSD: Posttraumatic Stress Disorder

Introduction

Iraqi people have been exposed to number of wars and traumatic periods for more three decades. The first war was the Iraq-Iran war from 1980 to 1988, followed by the chemical attacks in north Iraq from 1986 to 1989, the Gulf war in 1991, and more recently the U.S. war in Iraq from 20 March 2003 to 15 December 2011. The sectarian violence is on-going, causing hundreds of fatalities, including civilians who are killed in crossfire incidents by IEDs (improvised explosive devices), suicide bombs, or when the U.S. army targeted actual and suspected insurgents.

Given the level of frequency of violent events, several studies have been conducted with Iraqi participants, both inside and outside Iraq, to examine traumatic events and their aftermath, and the prevalence of traumatic stress after the last war in Iraq in 2003. All these studies reported that PTSD is widespread in Iraqi [1-5]. Despite the traumatic events and prevalence of PTSD in Iraq's population, mental health services in Iraq have been dramatically reduced since the 1980s. The number of workers in the mental health sector was one psychiatrist per 300,000 before 2003; by 2010 the number had dropped to one psychiatrist per one million [6].

Over the past three decades, many attempts have been made to develop interventions that might reduce the effects of trauma and prevent the onset of chronic PTSD. Several studies were examined different kind of therapies (e.g. EMDR, CBT, TF-CBT) with PTSD and related symptoms and showed that these interventions were effective with PTSD [7,8].

Although these interventions showed significant benefits, there are some limitations that lead to them not being chosen for use with the participants in the current study. One of these reasons was that many of these interventions need a highly qualified therapist and substantial experience in order to these interventions. According to the mental health service in Iraq, there is a lack of qualified therapists available to deliver in Iraq. However, with Emotional Freedom Technique (EFT) and Narrative Exposure Therapy (NET) a basic level of experience is required to conduct the therapy. These interventions are helpful as they are a low cost, brief and they do not require qualified therapist.

The second issue which was taken into account is that most of the interventions based on a long approach treatment and they require many sessions in order to obtain a benefit from the therapy. However, with EFT and NET, several studies showed that these interventions do not require long term sessions to obtain a benefit [9-12].

Several studies have been conducted with traumatised people who have PTSD or related symptoms. Karatzias et al. [13] conducted a controlled comparison of the effectiveness and efficiency of EMDR and EFT in alleviating PTSD symptoms in 42 patients from an NHS waiting list. The study showed that while both therapies reduced PTSD, EMDR had a greater effect than EFT.

A study was conducted among 77 male Haitian seminarians following the 2010 earthquake. The study aimed to investigate the effectiveness of EFT to treat PTSD. Participants received two days of instruction in Emotional Freedom Techniques (EFT). Following

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the EFT training, the results showed that all participants reported no PTSD and the scores were significantly decreased [14].

Recently, a case study was conducted by Sheldon [15] on an adult who had experienced a motor vehicle accident to examine the effectiveness of EFT on PTSD. A pre-test of PTSD was made, and the client was diagnosed with PTSD. Six sessions of EFT were applied to the client over an eight-week period. Post-test results indicated that there was an improvement in the score of PTSD, and the client no longer met the criteria of PTSD.

Another pilot study aimed to examine the benefits of EFT to reduce anxiety and enhance academic performance in university students. Participants were a group of 52 3rd year Foundation Degree level students. The students were given a 15 minute assignment workshop and were given a 15 minute introduction to EFT. The analyses indicated that 88% of the participants reported a significant reduction in SUDS, HAD, and HADS Anxiety Subscale. However, there was no difference in the HADS Depression [16].

EFT is one of these short treatment approaches; it is an acupressure-based treatment for psychological distress, developed by Gary Craig in the 1990s. It is derived from Thought Field Therapy (TFT) which has positive results in treating psychological problems by tapping on the body's acupressure points, and includes exposure, desensitisation through tapping on the body, and cognitive restructuring [17]. EFT works through mentally exposing the client to the memory of a traumatic event while the core beliefs are cognitively reframed with the use of spoken affirmations [18].

EFT has a link with the biological model of PTSD. This link is the amygdala, as when the individual is exposed to fear conditions, the amygdala starts to be sensitized to the presentation of subliminally threatening cues in patients with PTSD [19]; the activation of the amygdala will also be increased in PTSD patients. This part of brain was found also to be effective through using tapping in EFT procedures. A study showed that with EFT tapping mentally recreates the trauma/memory or trigger and that has the effect of putting the amygdala into the threat response mode while the tapping sends signals to the amygdala which decrease the threat response so now the brain is getting opposing messages [20].

The biological explanation has not been well studied and need more studies to investigate. However, psychological explanation was proposed and found that EFT and EMDR have similarities between them and perhaps with some traditional forms of therapy such as CBT [21]. With regards to PTSD, it is notable that both EFT and EMDR protocols include distraction and desensitization joined with exposure. As it was pointed out by Ehlers et al. [22] a way forward for identifying effective treatments for PTSD may be to expand the understanding of the mechanisms involved in the development of PTSD that should be targeted for treatment. However, this needs further investigation regarding the relationship between EFT and EMDR.

Although EFT has some psychological elements that are shared with other psychological therapies such as imaginal exposure, the mechanisms of EFT are still limited and unclear.

The purpose of comparing NET with EFT is because EFT does not yet have a good evidence base. In order to examine the effectiveness of EFT, an evidence based therapy was required in order compare the results of EFT with an evidence based therapy, such as NET in addition, people respond to different therapies in different ways, e.g. NET might be good for one person, while EFT for another [23].

Narrative Exposure Therapy (NET) is an evidence based therapy that was developed by Neuner et al., [24] and over the last 12 years in Germany. NET is a short-term treatment for trauma-spectrum disorders in survivors of multiple and complex trauma. NET was developed from a combination of Cognitive Behavioural Therapy (CBT) [24] and testimony therapy [25]. NET allows reflection on the person's entire life as a whole, fostering a sense of personal identity [12].

NET contextualizes the particular associative elements of the fear network: the sensory, affective and cognitive memories of trauma to understand and process the memory of a traumatic event in the course of the particular life of a client. Therefore, in NET, the patient, with the assistance of the therapist, constructs a chronological narrative of his life story with a focus on the traumatic experiences [26].

The development of NET was informed by the theoretical understanding of the autobiographical memory [27] and the framework it provides in understanding intrusive symptoms in previous theories [28,29] as well as neural fear networks and how this can be triggered in the brain [30]. The effects of NET justified the theoretical foundation of emotional habituation caused by the exposure [30] by activating the fear structure through exposure to the fear stimuli which were showed by high initial levels of emotional arousal- the traumatic memory of the participants, and providing corrective information about the stimuli, responses, and their meanings which were indicated by habituation to stimuli between sessions. In addition, the result supports the narrative approach efficiency in treating the distortion of the explicit autobiographic memory of traumatic events such as disorganised or fragmented memory, avoidance of thought, and trauma reminders [29]. Moreover, throughout this research, the distinction between declarative 'cold' memory which includes information about one's life and non-declarative 'hot' memory which contains sensory information in detail as well as cognitive and emotional perceptions was sustained. This finding is proposed in dual representation memory theory [31].

There is a large body of studies showing the effectiveness of NET in PTSD and related symptoms [11,23,32-34]. Both EFT and NET have been found to be effective for treating PTSD and anxiety and depression in several studies [11,35-37]. However, these interventions have not been examined yet in Iraq.

In order to examine the effect of EFT and NET, some risk factors for PTSD should be studied. There is a wide range of evidence which has indicated that some variables are considered to be risk factors for PTSD. One of these risk factors is social support; Brewin et al. [38] investigated risk factors for PTSD and found social support to have the strongest weighted average effect size (0.40). Other studies on victims of combat have found that social support is significantly related to the severity of PTSD symptoms [39,40].

Regarding to the coping strategies, there is a large body of studies examining the link between coping strategies and the outcome of traumatic events. For example, Galea et al. [41] conducted a review to examine the link between coping strategies and traumatic events. The study reviewed a number of studies about PTSD and found that five studies confirmed that less coping ability had a significant correlation with the onset of PTSD.

Religious coping is considered to be one of the risk factor for PTSD. The link between religious coping and PTSD has been investigated in several studies. A review of 11 studies found that most the studies indicate this link between religious and PTSD [42].

Another study was conducted among 1.061 undergraduate Students in US and aimed to examine the relationship between religious coping and PTSD. The result showed that religious coping was more strongly related to PTSD [43].

Studying some risk factors for PTSD is very important in the current study as to investigating whether the change in PTSD and related symptoms were due to the intervention itself or to other variables.

In sum, the continuous traumatic events in Iraq with the lack of mental health service in Iraq needs to develop and examine a short-term intervention to develop and promote ways of coping with traumatic events which could have an effective impact in preventing the development of trauma symptoms. In addition, this intervention should be accessible and of low cost. Therefore, EFT and NET could be effective interventions in helping traumatised people in Iraq to deal with and overcome their suffering.

Study aims

This study has aimed to achieve the following:

1. Examine the effectiveness of EFT and NET in decrease symptoms of PTSD, depression and anxiety.
2. Examine the benefits of EFT and NET in PTSD and anxiety and depression over time.
3. Examine the change in social support, coping strategies, and religious coping after using EFT and NET.

Methods

Participants

The study used two experimental groups and one control group. Randomisation and took place between December 2012 and January 2013 in Baghdad city. Participants were met the criteria for PTSD and randomly allocated into the three groups.

Eligible participants were male secondary school students aged between 16 -19 years old and who met the DSM-IV criteria for PTSD as measured by the Scale of Posttraumatic Stress Symptoms (SPTSS). Females were excluded as it was difficult to obtain permission from female schools to conduct this study.

Sixty students who meet the criteria for PTSD agreed to participate in this study. All participants gave informed consent after receiving a full explanation of the study design and objectives and explicit information regarding what the study entailed. This information was presented orally by the researcher.

Of this 340 students considered for the study, 209 met the inclusion criteria. With regard to the exclusion criteria, 131 of 209 participants were excluded as they had either partial or non-PTSD symptoms. In addition, 99 students declined being involved in this study and 50 students were not contactable. Hence, 60 participants were agreed to participate in this study.

Measures

Five scales were administered: Baghdad Trauma History Screen (BTHS), Scale of Posttraumatic Stress Symptoms (SPTSS), coping strategies, Social Support Scale and Brief Religious Coping.

Baghdad Trauma History Screen (BTHS): This scale was developed by Jaber [4]. This scale was used in order to screen the traumatic

events in Baghdad city. The original version involved 21 traumatic events (rows) and seven responses (columns) for each event. The participant should determine firstly if he was personally exposed or if the event happened to a close person, then the age when that occurred and the frequency of occurrence. After that, he should report if he has felt fear, horror, or helplessness.

Scale of Posttraumatic Stress Symptoms (SPTSS): This scale has been used widely in the Iraqi population. It was developed by Jaber [4] and is validated in the Iraqi population. The scale is comprised of 17 items to closely match the PTSD symptoms criteria in DSM-IV. A five -point scale was used in this scale to estimate symptom occurrence during the last month. The scale options are: 0="not at all", 1="1 to 2 times", 2="almost every day", 3="about once every day" and 4="more than once every day".

In terms of the reliability of this scale, Cronbach's alpha was used to indicate internal consistency. The scores were 0.90, 0.84, 0.82, and 0.67 for the total scale, re-experience, avoidance, and hyper-arousal subscales, respectively. Furthermore, test-retest reliability was used, and the scores were 0.83, 0.80, 0.78, and 0.77 for the total scale, and the re-experiencing, avoidance, and hyper-arousal subscales respectively.

Coping strategies (Brief Coping): The scale was validated in the Iraqi population and developed by Jaber [4]. This scale included 26 items to measure coping strategies and was comprised of four subscales: seeking support, coping strategies, active coping strategies, non-problem focused coping strategies, and substance use factor. The responses to the items were 1 (I haven't been doing this at all), 2 (I've been doing this a little bit), 3 (I've been doing this a medium amount) and 4 (I've been doing this a lot). Cronbach alpha showed a good internal reliability, alpha scores were 0.82, 0.79, 0.67, and 0.70 for seeking support coping strategies, active coping strategies, non-problem focused coping strategies, and substance use factors respectively. Test-retest reliability correlations ranged from 0.74 to 0.83.

Social support scale: This scale has been validated in an Iraqi population and developed by Jaber [4]. The scale contains 14 items, and it aims to measure three sources of social support which are family, friends, and governmental and non-governmental organisations (NGO). A four-point scale ranging from "very much" to "not at all" was used to rate the items for each one of the support sources: family, friends, and GO-NGO. Regarding reliability, Cronbach's Alpha was used on each source of social support, and there were 0.95, 0.97, and 0.95 for family, friends, and NGO respectively.

Religious Coping (Brief RCOPE): The Brief RCOPE is a 14-item questionnaire assessing two styles of religious coping: positive and negative (7 items for positive and 7 items for negative). This scale is based on a four-point scale ranging from 0 ("not at all") to 3 ("a great deal") [44].

This scale has been translated from English to Arabic, then to English again by a different interpreter. Furthermore, all items were reviewed by five psychologists in Baghdad universities. Factor analysis and Cronbach's Alpha were used for this purpose and the scores of the Alpha for both subscales were: Positive side ($\alpha = 0.86$) and Negative side ($\alpha = 0.82$).

The Hospital Anxiety and Depression Scale (HADS): To evaluate anxiety and depression symptoms in the current study, the Arabic version of the Hospital Anxiety and Depression Scale (HADS) was used [4]. HADS has been extensively used for both general

populations and patient samples. The Arabic version of HADS is a 14-item questionnaire and has two sub-scales; seven items for anxiety and seven items for depression. Each item has a choice of four responses which are rated from 0 - 3. Cronbach's Alpha was 0.75 for anxiety and 0.78 for depression. In addition, Test-Retest reliability correlations were 0.62 and 0.69 for the seven item anxiety and the seven item depression subscales, respectively.

Procedures

A randomized control group was used for this study. Sixty students who met the inclusion criterion of PTSD according to DSM-IV were selected from 403 students from four secondary schools in Baghdad who had already participated in a previous study of what (reference your paper here). All participants agreed after receiving a full explanation of the study design and objectives and then were asked to sign the consent form. This study was approved by the Institute of Work, Health and Organisations (I-WHO) Ethics Committee at The University of Nottingham, UK.

The participants were randomly allocated into three groups; EFT (n=20), NET (n=20) and control group (n=20). The randomisation was conducted by a computer-generated list of random numbers. The assessment of the screening process (T1) was used as the baseline.

Those in the EFT and NET groups received four therapy sessions of 60-90 minutes each, which lasted two weeks with three or four days between each session, while the control group had no treatment. The number of the sessions for both EFT and NET were based on previous studies showing that four sessions would be effective with PTSD [11,45,46]. All three groups were assessed post-treatment (T2) and after a three months follow-up (T3), six months follow-up (T4), and 12 months follow-up (T5).

Figure 1 presents the research and treatment schedules for the three groups. There was one participant who withdrew in the NET group, with all participants completing the post-test and follow-up.

The first follow-up was conducted by the researcher through paper-based questionnaires. However, the rest of the follow-up was done through Web-based questionnaires.

Emotional Freedom Technique (EFT) is an acupressure-based treatment for psychological distress, developed by Gary Craig in the 1990s. The client taps on specific meridian points while talking through traumatic memories. Through this tapping, some signals will be sent to the amygdala, and that leads to reducing hyper-arousal through acupressure and related techniques [47].

NET is a short-term approach that has been adapted to meet the needs of traumatized survivors of war and torture [48]. The aims of NET are two-fold: to reduce PTSD symptoms by encouraging the client to face up to the memories of the traumatic event, and to construct a detailed narrative of the event and its consequences [49]. Both therapies were delivered by the researcher and took place between November 2012 and January 2013.

Ethical Issue

Ethical approval for this study was obtained from the Institute of Work, Health and Organisation's Ethics Committee at The University of Nottingham.

A consent form was presented to the participants to sign before they participated in the study. The form included the purposes

of the study (administrating questionnaires and conducting an experiment), the study procedures including the response to paper-based questionnaires about post-traumatic stress symptoms, social support, brief cope, depression and anxiety symptoms, and religious brief cope. The participants were told that the experiment included four sessions of intervention and response to the questionnaires before and after using the sessions. They were told that due to their responses to the questionnaires and participation in the experiment, some distress might be felt; this would be temporary. Otherwise, they were told to call the Counselling Unit in the Educational Studies and Psychological Research Centre at the University of Baghdad.

The participants were told that were free to withdraw their consent and discontinue participation at any time. Furthermore, they were told that their information would be confidential, anonymous and voluntary, and that the results from this study may be published.

Statistical analysis

A univariate analysis of covariance (ANCOVA) was used to analyse the changes in the scores of the variables from pre- to post-treatment, while controlling for pre-treatment scores. Changing within-group of the three groups from pre- to post-treatment were tested using paired t-tests. In addition, Hedge's g was calculated to measure the effect size for within- and between-group changes. The long-term treatment effects of both EFT and NET were analysed using repeated measures ANOVAs with the pre-test, post-test and four follow-up scores and three groups. Pair wise differences were measured using paired t-tests with a Bonferroni correction. SPSS version 20 was used to analyse all the results.

Results

Baseline assessments

Baseline assessments were conducted on three groups; EFT, NET, and control groups to check whether the three groups were comparable. Table 1 shows that there were no significant differences between the experimental groups and control group in all variables, apart from participants in the control group who reported more social support received from family than those in the experimental groups. Thus, the participants in the three groups had a similar level of PTSD and related variables before the intervention was given.

Treatment effect

Table 2 showed the mean scale scores of the three groups at each time point (T1, T2, T3, T4, and T5).

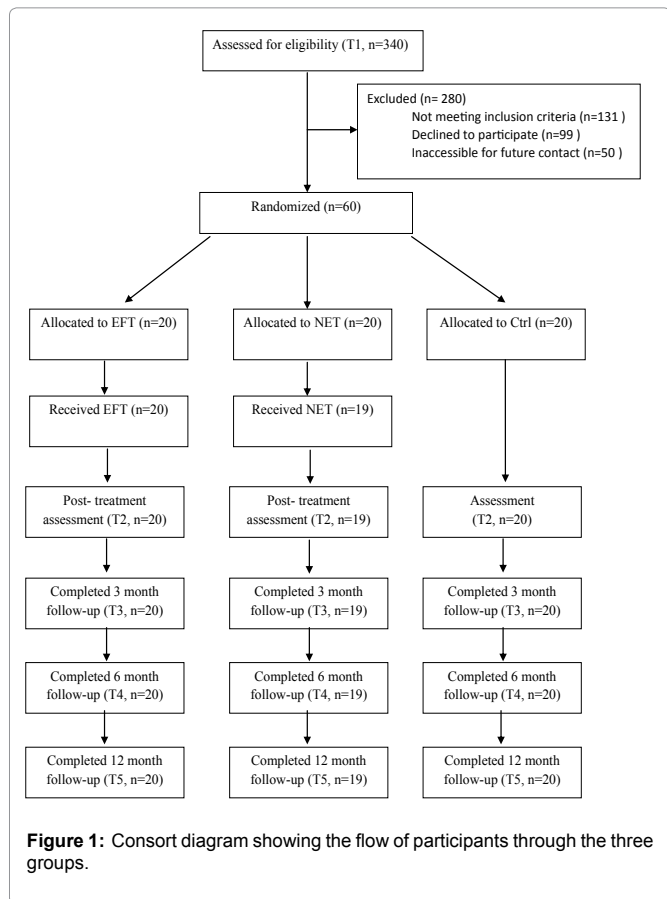
Initial treatment outcome

The initial treatment outcome analyses are described in Table 3 and 4. Paired t-tests revealed that EFT and NET groups experienced significant reductions on PTSD symptoms, avoidance, hyper-arousal, re-experience, anxiety, and depression from T1 to T2. However, no significant changes were found in coping strategies, social support, and religious cope.

Univariate ANCOVAs on post-treatment scores controlling for pre-treatment scores revealed significant between-group effects for PTSD symptoms, avoidance, hyper-arousal, re-experience, anxiety, depression, active coping, and seeking support.

Post-hoc tests revealed that the EFT group showed fewer score ($p>0.05$) than the control group in PTSD, avoidance, re-experience, hyper-arousal, anxiety, and depression. With regards to NET groups,

the post-hoc test showed that the scores of NET were less ($p > 0.05$) than the control group in PTSD, re-experience, hyper-arousal. In addition, seeking support was improved in NET group ($p > 0.05$).



Within and between-group effect sizes for the outcome measures are included in Table 3. The results of pre to post treatment showed large effect sizes (≥ 0.80) within-group were found in the EFT group in PTSD, avoidance, hyper-arousal, re-experience, anxiety and depression, while small effect sizes (0.20-0.49) within-group were found in seeking support, non-problem, substance use, and positive religious cope. With regard to NET group, moderate effect sizes were found in PTSD, avoidance, hyper-arousal, re-experience, and substance use, while small effect sizes were found in active coping, government support, and anxiety. In control group, the effect sizes were found in seeking support, active coping, substance, family support, and government support. With small (0.20-0.49) between-group effect sizes were found on PTSD with all three groups, non-problem with EFT and control groups, government support with EFT and NET groups, positive religious coping with EFT and control groups, re-experience, negative religious coping with control group, hyper arousal and active coping with NET group.

In terms of the effect sizes between- groups, large effect sizes in EFT group were found in PTSD, avoidance, re-experience hyper arousal, family support, government support, and anxiety. Moderate effect sizes were also found in EFT group in depression and friends support. In the NET group, moderate effect sizes between- groups were found in PTSD, re-experience, avoidance, seeking support and family support.

Small (0.20-0.49) between-groups effect sizes in EFT group were found in active coping, non-problem, substance use, and positive religious cope. At the same time, there were a small between- group effect sizes for NET group were found in active coping, non-problem, substance use, friend support, and anxiety.

Twelve months follow - up: PTSD

The pre-test, post-test and follow-ups of three months, six months, and 12 months scores were analysed using repeated measure ANOVAs

Table 1: Means, SDs, and f Values of the three groups at the Baseline Tests.

	Variables	EFT Group		NET Group		Control Group		f	p
		M	SD	M	SD	M	SD		
PTSD	Overall PTSD	23.60	8.05	23.31	8.52	22.95	8.95	0.029	0.97
	Avoidance	10.45	2.89	10.00	3.29	9.35	4.19	0.497	0.61
	Re-experience	5.40	4	5.57	4.29	5.35	2.73	0.020	0.98
	Hyper-arousal	7.75	3.82	7.73	2.46	8.25	3.91	0.140	0.87
Coping strategies	Seeking support	18.90	4.72	18.26	4.94	16.30	5.59	0.25	0.25
	Active coping	16.85	4.81	15.94	5.15	13.85	3.95	2.17	0.12
	Non-problem focused coping	12.25	3.02	10.73	3.60	11.20	3.69	0.99	0.37
	Substance use	2.15	0.48	2.36	0.83	2.90	1.61	2.49	0.92
Religious cope	Positive Religious	17.40	2.56	17.47	4.04	16.50	2.58	0.59	0.55
	Negative Religious	12.80	3.18	12.36	3.96	13.45	3.70	0.64	0.64
Social support	Family support	25.55	7.32	23.73	9.31	15.45	4.57	10.86	0.001**
	Friends support	19.10	9.27	16.52	11.74	13.00	4.67	2.31	0.09
	Gov support	1.45	5.13	2.26	4.39	2.15	1.53	0.240	0.78
HADS	Anxiety	9.15	2.71	9.52	4.12	9.10	3.85	0.08	0.92
	Depression	7.15	3.31	6.57	3.43	7.05	3.81	0.14	0.86

**p<0.01

Table 2: Measures over time for treatment in EFT, NET and control group.

	Groups	T1	T2	T3	T4	T5
		M (SD)	M (SD)	M (SD)	M (SD)	M (SD)
PTSD	EFT	23.60 (8.05)	13.65 (5.38)	14.20 (5.47)	14.45 (4.76)	16.80 (6.51)
	NET	23.31 (8.52)	18.26 (6.56)	19.31 (11.66)	18.89 (7.54)	22.00 (9.30)
	Ctrl	22.95 (8.95)	25.05 (10.90)	26.45 (11.17)	22.10 (10.31)	28.20 (10.97)
Avoidance	EFT	10.45 (2.89)	6.75 (2.69)	6.95 (5.18)	5.85 (2.10)	5.85 (2.94)
	NET	10.00 (3.29)	7.68 (3.05)	8.47 (4.69)	8.42 (3.42)	8.52 (4.14)
	Ctrl	9.35 (4.19)	10.00 (4.61)	9.20 (5.24)	9.25 (4.70)	9.95 (4.33)
Re-experience	EFT	5.40 (4.00)	1.90 (1.71)	3.90 (4.10)	4.00 (1.80)	4.50 (2.28)
	NET	5.57 (4.29)	3.36 (2.45)	4.15 (3.67)	4.52 (2.31)	5.36 (2.77)
	Ctrl	5.35 (2.73)	6.30 (3.82)	8.05 (3.88)	6.25 (2.80)	7.90 (4.16)
Hyper-arousal	EFT	7.75 (3.82)	5.00 (3.21)	6.35 (3.55)	4.60 (2.79)	6.45 (2.41)
	NET	7.73 (2.46)	7.21 (3.15)	6.68 (4.53)	5.94 (3.20)	8.10 (3.36)
	Ctrl	8.25 (3.91)	8.75 (4.33)	9.20 (4.17)	6.60 (5.01)	10.35 (3.75)
Seeking support	EFT	18.90(4.72)	19.95(3.34)	17.85 (3.51)	17.90 (3.14)	16.85 (3.42)
	NET	18.26(4.94)	17.57(4.43)	16.73 (4.54)	16.89 (3.99)	17.89 (4.60)
	Ctrl	16.30 (5.59)	19.85 (4.23)	17.75 (3.14)	16.20 (3.30)	17.25 (4.42)
Active coping	EFT	16.85(4.81)	17.10(4.01)	13.75 (3.83)	14.70 (3.52)	13.75 (3.59)
	NET	15.94(5.15)	14.15(4.28)	15.21 (3.79)	14.10 (2.99)	14.26 (3.88)
	Ctrl	13.85 (3.95)	16 (3.12)	14.40 (3.31)	13.70 (2.90)	14.60 (3.71)
Non-problem focused coping	EFT	12.25(3.02)	10.95(3.50)	12.00 (2.49)	11.80 (2.23)	11.40 (2.30)
	NET	10.73(3.60)	10.84(3.02)	9.05 (2.32)	11.00 (2.02)	9.63 (2.00)
	Ctrl	11.20 (3.69)	12.05 (2.50)	11.50 (1.96)	10.85 (2.68)	11.90 (2.88)
Substance use	EFT	2.15(0.48)	2.00(0.00)	2.00 (0.00)	2.00 (0.00)	2.00 (0.00)
	NET	2.36(0.830)	2.05(0.22)	2.05 (0.22)	2.42 (0.69)	2.15 (0.37)
	Ctrl	2.90 (1.61)	2.25 (0.78)	2.60 (1.35)	2.65 (1.03)	2.50 (1.00)
Family support	EFT	22.30(6.30)	21.70(7.65)	11.20 (3.80)	13.15 (5.76)	9.50 (7.00)
	NET	21.73(7.79)	21.21(7.56)	13.47 (4.28)	12.84 (9.52)	13.73 (6.77)
	Ctrl	12.70 (4.07)	15.70 (6.35)	19.85 (8.57)	15.00 (9.31)	12.85 (7.05)
Friends support	EFT	16.65(7.62)	16.45(9.70)	12.20 (11.14)	12.05 (11.16)	9.90 (6.99)
	NET	14.94(9.87)	13.57(9.47)	12.94 (9.65)	13.52 (8.70)	8.94 (6.77)
	Ctrl	11.55 (3.66)	11.25 (4.67)	14.70 (8.18)	10.70 (7.27)	9.25 (6.68)
Gov support	EFT	1.30(4.47)	0.150(0.366)	0.60 (1.53)	0.65 (1.53)	0.40 (0.94)
	NET	2.10(4.10)	1.10(2.15)	1.36 (2.26)	1.36 (1.70)	1.68 (2.82)
	Ctrl	1.70 (1.45)	1.00 (1.12)	1.80 (4.13)	1.30 (3.02)	1.00 (2.24)
Anxiety	EFT	9.15(2.71)	5.65(1.84)	5.50 (2.66)	6.15 (3.71)	6.40 (2.16)
	NET	9.52(4.12)	8.42(3.56)	8.10 (3.90)	7.10 (2.72)	6.57 (3.25)
	Ctrl	9.10 (3.85)	7.75 (2.73)	7.55 (3.66)	9.05 (3.31)	9.10 (3.66)
Depression	EFT	7.15(3.31)	4.30(1.86)	4.70 (2.69)	4.65 (1.72)	3.95 (1.23)
	NET	6.57(3.43)	6.73(2.74)	5.15 (2.81)	4.78 (2.70)	5.00 (2.62)
	Ctrl	7.05(3.81)	6.55 (3.61)	6.45 (3.47)	6.70 (3.57)	7.45 (3.53)
Positive Religious	EFT	17.40(2.56)	16.65(3.45)	17.40 (3.57)	17.15 (3.08)	17.30 (2.99)
	NET	17.47(4.04)	17.05(3.27)	17.94 (2.48)	17.73 (2.25)	18.36 (2.92)
	Ctrl	16.50 (2.58)	17.50 (2.23)	15.90 (3.00)	15.50 (2.54)	16.60 (3.87)
Negative Religious	EFT	12.80(3.18)	12.15(3.45)	11.80 (2.70)	12.50 (3.42)	12.30 (2.43)
	NET	12.36(3.96)	11.68(3.11)	11.78 (2.25)	12.42 (3.11)	11.47 (2.19)
	Ctrl	13.45 (3.70)	12.10 (4.01)	12.95 (3.91)	13.25 (3.33)	12.90 (2.79)

with the three groups. The results of ANOVAs was presented in Table 5 with five levels of time; pre-treatment (T1 for EFT, T1 for NET, T1 for Ctrl), post-treatment (T2 for EFT, T2for NET, T2 for Ctrl), and three months follow-up (T3 for EFT, T3 for NET, T3 for Ctrl), six months follow-up (T4 for EFT, T4 for NET, T4 for Ctrl), 12 months follow-up (T5 for EFT, T5 for NET, T5 for Ctrl).

The results showed that there were significant times effects post treatments across the variable of PTSD overall and its clusters ($p < 0.05$) (Table 4).

Comparison of Pre-test, Post-test, and the three times of follow-ups showed a significant reduction of scores after treatment in all PTSD clusters (Figure 2). However, there were not significant effects times \times group interaction effect for the PTSD clusters with the exception of PTSD overall. According to the effect size of each group of PTSD and its clusters, the result showed that EFT has the largest effect size over the time than NET and control groups in PTSD overall and its cluster. However, the results of NET group showed that the effect size was moderate and decreased to small over the time (0.65-.14). Finally, the control group showed a smaller effect size than EFT and NET.

Table 3: Results of outcome measures of T1 and T2. Means difference, 95% CI, paired t-test, within group effect sizes, ANCOVA analysis, and between group effect sizes.

Variables	Groups	Mean difference (T1-T2)	95% CI	Within -groups		Effect size	Between -groups		Effect size (vs. Ctr)	Post-hoc (Tukey)
				df	t		df	f		
PTSD	EFT	2.67	(6.07 to 3.82)	19	5.36*	1.45	2-58	10.59**	-1.32	1/3*
	NET	1.96	(0.175 to 9.92)	18	2.17*	0.66			-0.75	2/3*
	Ctr	-1.94	(-5.00 to 0.80)	19	-1.51	-0.21			-	-
Avoidance	EFT	0.19	(1.76 to 5.63)	19	4.00*	1.32	2-58	5.40**	-0.80	1/3*
	NET	0.24	(0.19 to 4.44)	18	2.28*	0.73			-0.60	-
	Ctr	-0.41	(-2.65 to 1.35)	19	-0.28	-0.14			-	-
Re-experience	EFT	2.29	(1.57 to 5.42)	19	3.79*	1.13	2-58	6.98**	-1.48	1/3*
	NET	1.84	(0.01 to 4.41)	18	2.11*	0.63			-0.70	2/3*
	Ctr	-1.08	(-2.22 to 0.32)	19	-1.59	-0.28			-	-
Hyper-arousal	EFT	0.61	(1.01 to 4.48)	19	3.31*	0.77	2-58	4.45*	-0.98	1/3*
	NET	-0.68	(-1.04 to 2.09)	18	0.70	0.18			-0.40	2/3*
	Ctr	-0.42	(-2.16 to 1.16)	19	-0.62	-0.12			-	-
Seeking support	EFT	-1.05	(-3.07 to 0.97)	20	-1.08	-0.25	2,58	4.12*	0.02	-
	NET	0.69	(-1.45 to 0.82)	19	0.671	0.14			-0.52	2/3*
	Ctr	-3.55	(-5.92 to -1.17)	20	-3.13	-0.70			-	-
Active coping	EFT	-0.25	(-2.35 to 1.85)	20	-0.248	-0.05	2,58	3.57*	0.30	-
	NET	1.79	(-0.69 to 4.27)	19	1.51	0.37			-0.49	-
	Ctr	-2.15	(-4.06 to -0.23)	20	-2.34*	-0.59			-	-
Non-problem focused coping	EFT	1.3	(-0.133 to 0.73)	20	1.89	0.39	2,58	1.55	-0.36	-
	NET	-0.11	(-2.05 to 1.84)	19	-0.113	-0.03			-0.43	-
	Ctr	-0.85	(-2.95 to 1.25)	20	-0.84	-0.26			-	-
Substance use	EFT	0.15	(-0.079 to 0.379)	20	1.37	0.43	2,58	0.47	-0.45	-
	NET	0.31	(-0.11 to 0.742)	19	1.55	0.50			-0.34	-
	Ctr	0.65	(-0.12 to 1.42)	20	1.74	0.50			-	-
Family support	EFT	0.6	(-2.19 to 0.39)	20	0.449	0.08	2,58	0.015	0.85	-
	NET	0.52	(-2.73 to 0.78)	19	0.339	0.06			0.78	-
	Ctr	-0.3	(-6.02 to 0.021)	20	-2.07*	-0.55			-	-
Friends support	EFT	0.2	(-2.25 to 2.65)	20	0.170	0.02	2,58	0.346	0.68	-
	NET	1.37	(-1.73 to 4.46)	19	0.928	0.14			0.31	-
	Ctr	0.3	(-1.90 to 2.50)	20	0.28	0.07			-	-
Gov support	EFT	1.15	(-0.95 to 3.25)	20	1.14	0.35	2,58	2.73	-1.02	-
	NET	1	(-0.28 to 2.28)	19	1.63	0.30			0.05	-
	Ctr	0.7	(0.10 to 1.29)	20	2.48*	0.53			-	-
Anxiety	EFT	3.5	(1.79 to 5.20)	20	4.28**	1.48	2,58	4.37**	-0.90	1/2*
	NET	1.1	(-0.82 to 3.03)	19	1.20	0.28			0.21	-
	Ctr	1.35	(-1.44 to 1.74)	20	0.197	0.40			-	-
Depression	EFT	2.85	(0.97 to 4.72)	20	3.17**	1.04	2,58	3.63*	-0.78	1/2**
	NET	-0.16	(-2.01 to 1.70)	19	-0.178	-0.05			0.05	-
	Ctr	0.5	(-0.95 to 1.95)	20	0.72	0.13			-	-
Positive Coping	EFT	0.75	(-0.38 to 1.88)	20	1.38	0.24	2,58	1.31	-0.29	-
	NET	0.42	(-0.97 to 1.81)	19	0.634	0.11			-0.16	-
	Ctr	-1	(-2.67 to 0.67)	20	-1.24	-0.40			-	-
Negative Coping	EFT	0.65	(-0.11 to 1.41)	20	1.78	0.19	2,58	0.085	0.013	-
	NET	0.68	(-1.53 to 2.89)	19	0.649	0.18			-0.11	-
	Ctr	1.35	(-0.30 to 3)	20	1.71	0.34			-	-

*p<0.05; **p<0.01

Although EFT has decreased significantly more than NET, the NET group also showed a reduction in PTSD but is less than EFT group. After T3 it seems that this reduction did not undergo further as it was at time 2. The effectiveness of EFT and NET become less but still significant. The control group did not undergo as EFT and NET groups.

Twelve months follow - up: HADS

Repeated measure ANOVAs were used to analyse the scores of the pre-test, post-test and follow-up of three months, six months, and 12 months scores with the three groups. The results of the mixed ANOVAs are presented in Table 5 with five levels of time with the

Table 4: Repeated ANOVA of time (pre-treatment, post-treatment, follow-up) × Groups (EFT, NET, Ctrl) with effect size.

Measures	groups	Time			Time * Group			Effect size			
		df	f	p	df	f	p	Pre/ Post	Pre/ Fu1	Pre/ Fu2	Pre/ Fu3
PTSD	EFT	4-56	3.79	0.005**	4-56	2.14	0.033*	1.42	1.33	1.35	0.91
	NET							0.65	0.38	0.53	0.14
	Ctrl							-0.20	-0.033	0.08	-0.51
Avoidance	EFT	4-56	2.99	0.020*	4-56	1.67	0.10	1.29	0.81	1.78	1.54
	NET							0.71	0.37	0.46	0.38
	Ctrl							-0.14	0.03	0.02	-0.13
Hyper-arousal	EFT	4-56	4.76	0.001**	4-56	0.974	0.45	1.11	0.36	0.44	0.27
	NET							0.61	0.34	0.30	0.05
	Ctrl							-0.17	-0.50	0.18	-0.46
Re-experience	EFT	4-56	3.53	0.008**	4-56	1.94	0.56	0.76	0.37	0.90	0.40
	NET							0.18	0.28	0.61	-0.12
	Ctrl							-0.11	-0.23	0.35	-0.53

*p<0.05; **p<0.01

Table 5: Repeated ANOVA of time (pre-treatment, post-treatment, follow-up) × Groups (EFT, NET, Ctrl) with effect size.

Measures	Groups	Time			Time * Group			Effect size			
		df	f	p	df	f	p	Pre/ Post	Pre/ Fu1	Pre/ Fu2	Pre/ Fu3
Anxiety	EFT	4-56	4.94	0.001**	4-56	1.89	0.06	1.51	1.33	0.93	1.09
	NET							0.28	0.35	0.68	0.78
	Ctrl							0.10	0.49	0.12	0.10
Depression	EFT	4-56	3.34	0.01**	4-56	1.80	0.07	1.04	0.80	0.93	1.25
	NET							-0.05	0.44	0.57	0.50
	Ctrl							0.13	0.16	0.09	-0.10

*p<0.05; **p<0.01

three groups (EFT, NET, and, Control group).

The result showed that there were significant times effects post treatments for both anxiety ($F(4, 56) = 4.94, p = 0.001$) and depression ($F(4, 56) = 3.34, p = 0.01$). However, there was no significant interaction effect in both the measurements.

Regarding to the effect size, the result of EFT groups showed that effect size was higher than NET and control group at the post-test and the follow-ups times in both anxiety and depression; (0.93-1.51) and (0.80-1.25) respectively. However, although NET has small effect size at the post-test in both HADS subscales, the effectiveness has increased significantly at the three times of follow-ups. This results indicated that both EFT and NET have effectiveness in anxiety and depression (Figures 2 and 3).

Twelve-month follow-up: Risk factors

A repeated measures ANOVA was used to analyse the scores of pre-test, post-test and follow-up of three months, six months, and 12 months scores with the three groups. The results are presented in Table 6 with five levels of time with the three groups (EFT, NET, and, Control group).

Comparison of Pre-test, Post-test, and the three times of follow-ups showed a significant reduction in scores on active coping, seeking support, family support, and friend support ($p < 0.05$) after interventions. However, effects times × group interaction effect was only found in social support received from family, while not significant effect were found across the other variables.

Regarding the variables that showed significant change over the time, the effect size of EFT in seeking support remained stable over the three follow-ups and went up at time 3. However, with NET group,

the improvement has increased slightly at follow-up 1 and 2 with a decrease in follow-up 3. In contrast, the effect sizes of NET group remained stably with a reduction was found at follow-up 1. With regard to active coping, the result showed that the effect sizes of EFT group have improved dramatically over the three follow-ups (Figure 4).

Although, significant effect sizes were found in social support received from family and friends, this difference does not mean that groups of EFT and NET have received more support at the three follow-ups. Contrariwise, the social support becomes less than the pre-test (Table 2).

Discussion

The baseline assessments showed that the participants across the three groups had similar levels of PTSD, anxiety and depression, coping strategies, social support, and use of religious coping. Exceptionally, the participants in the experimental group of EFT and NET reported more social support received from family than those in the control group.

Moreover, PTSD scores in both the experimental groups at the post-tests were lower than the scores at the pre-tests while the PTSD scores of the control group increased at the post-test. In terms of PTSD clusters, the results showed that the participants who received EFT reported a significant difference in all PTSD cluster at pre-test and post-test.

Regarding NET group, the results showed a significant difference decrease between pre-test and post-test in avoidance and re-experience, while no significant difference was found in hyper-arousal. These results are consistent with previous studies that examined the effectiveness of EFT with PTSD overall and related symptoms e.g. [15,50,51]. However, no studies have been found to examine EFT

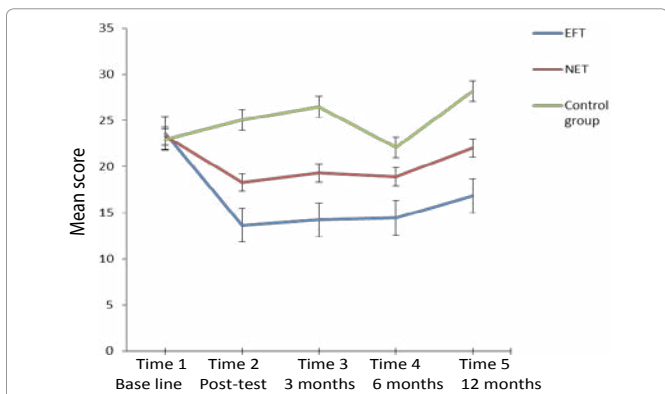


Figure 2: Mean scores for PTSD of three groups.

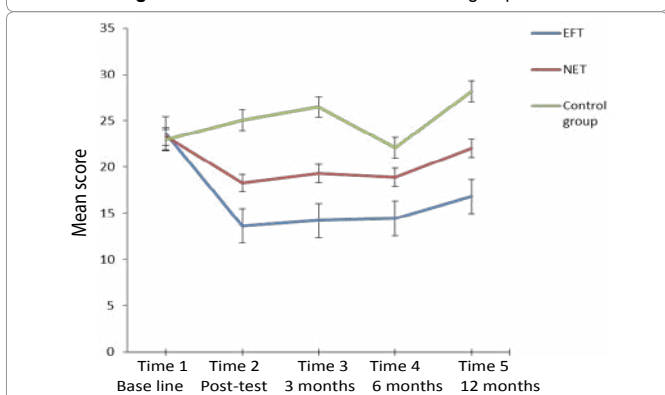


Figure 3: Mean scores for Anxiety of three groups.

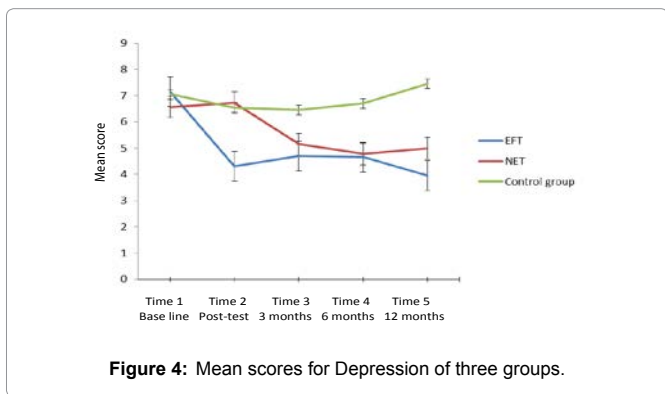


Figure 4: Mean scores for Depression of three groups.

with PTSD clusters. The results of NET were found to be consistent with the previous research which examined the effectiveness of NET whether with PTSD overall or with PTSD clusters e.g. [11,24].

A probable explanation is that re-experience and avoidance symptoms can easily be triggered by things, words, events and situations that remind people of the traumatic event, while hyper arousal symptoms may be constant and not being triggered by trauma-related reminders. Furthermore, hyper arousal symptoms are likely to be constant, instead of being triggered by things that remind one of the traumatic events. These symptoms may cause difficulty in undertaking daily tasks such as sleeping, eating or concentrating. Some researchers suggested that chronic alterations in the central neurotransmitter systems lead to physiological hyper-arousal following traumatic incidents [52]. Therefore, these physiological

changes following trauma may not respond to such interventions.

The four sessions of NET may not be enough to produce changes in hyper arousal symptoms. In addition, individual differences can play an important role with traumatised people that may need different approaches to deal with traumatic experiences and symptoms. This result may also suggest that the effects of NET may depend on the severity of PTSD.

Regarding the follow-ups, the results showed that there is a significant difference between groups in terms of the time during 12 months. The effect size of EFT was higher than NET and the control group whether in PTSD overall or PTSD clusters. This result indicated that EFT was more effective than NET. This could be because of the nature of the EFT process that just focuses on the main traumatic events rather than talking about life story that used with NET sessions. According to Iraqi culture, males prefer not to talk about their life in the same way as females, and that could explain that males in this study were found EFT more appropriate for them.

With regard to anxiety and depression, the current study found that EFT was significantly more effective than NET at reducing reduce anxiety and depression symptoms. In addition, these reductions remained fairly consistent over 12 months. However, the NET group showed that this intervention had a small effect size in anxiety from pre-test to post-test, while it was not significant effective on depression.

Interestingly, the effectiveness of NET in anxiety and depression increased from three months to 12 months.

No changes in anxiety and depression were found in the control group. This result is consistent with previous research that found EFT and NET to be effective in reducing anxiety symptoms [11,16,37,53,54]. In addition; the participants of EFT and NET reported lower scores of depression symptoms over time overall. This finding is supported by Zang et al [11] and Stapleton et al. [55], who found EFT and NET to be effective in reducing depression symptoms. However, with the NET group there was no change found at post-test and the scores of depression symptoms started to decrease after three months of the NET therapy.

Regarding coping strategies, the current study found significant improvements in both the EFT and NET intervention groups. Support seeking and active coping were increased after therapy, while the strategies of using non-problem and focused coping were decreased. With the control group, the participants reported less support seeking and active coping and more use of non – problem and focused coping. So, this result might imply that these interventions can change coping strategies in a positive way as it is helping the person to develop skills. To the researchers' best knowledge, the effectiveness of EFT on coping strategies has not been examined. However, NET was found to be an effective in improving coping strategies after using the NET intervention. Zang's study [11] found that NET has improved the coping strategies with traumatised people.

A probable explanation can be given to this result that tapping in EFT can increased distraction and that could reflects enhanced adaptive response to the life stress. The exposure procedure of EFT weakened the fear triggered effect of earthquake memory [56] and reduced intrusive thoughts of traumatic memory might provide a decent experience of anxiety managing, they might be able to learn from this experience and apply it to other stresses.

Table 6: Repeated ANOVA of time (pre-treatment, post-treatment, follow-up) × groups (EFT, NET, Ctrl) effect sizes.

Measures	Groups	Time		Group		Time * Group		Effect size			
		df	f	df	f	df	f	Pre/Post	Pre/ Fu1	Pre/Fu2	Pre/Fu3
Seeking support	EFT	4-56	3.01**	4-56	.67	4-56	1.43	-0.25	0.24	0.24	0.48
	NET							0.22	0.39	0.37	0.15
	Ctrl							-0.70	-0.31	0.02	-0.18
Active coping	EFT	4-56	3.23**	4-56	.43	4-56	2.24	-0.05	0.70	0.50	0.71
	NET							0.37	0.16	0.43	0.36
	Ctrl							-0.59	-0.14	0.04	-0.19
Non-problem focused coping	EFT	4-56	.49	4-56	4.29**	4-56	.08	0.38	0.008	0.16	0.31
	NET							-0.03	0.54	-0.09	0.36
	Ctrl							-0.26	-0.09	0.10	-0.20
Substance use	EFT	4-56	1.08	4-56	7.01**	4-56	.97	0.43	0.43	0.43	0.43
	NET							0.97	0.97	0.10	0.54
	Ctrl							0.50	0.19	0.18	0.29
Family support	EFT	4-56	18.42**	4-56	0.46	4-56	1.18**	0.08	2.09	1.48	1.88
	NET							0.06	1.28	1	1.07
	Ctrl							-0.55	-1.04	-0.31	-0.02
Friends support	EFT	4-56	5.82**	4-56	0.51	4-56	1.55	0.02	0.45	0.47	0.90
	NET							0.14	0.20	0.15	0.69
	Ctrl							0.07	-0.48	0.14	0.41
Gov support	EFT	4-56	1.52	4-56	1.67	4-56	.22	0.35	0.20	0.19	0.27
	NET							0.30	0.21	0.23	0.11
	Ctrl							0.52	-0.03	0.16	0.36
Positive Coping	EFT	4-56	1.99	4-56	2.17	4-56	.31	0.24	0.00	0.08	0.03
	NET							0.11	-0.13	-0.07	-0.24
	Ctrl							-0.40	0.21	0.38	-0.02
Negative Coping	EFT	4-56	.44	4-56	0.95	4-56	.1.14	0.19	0.33	0.08	0.17
	NET							0.19	0.18	-0.01	0.27
	Ctrl							0.34	0.12	0.05	0.16

*p<0.05; **p<0.01

With NET, The improvement in support seeking and active coping might be because the experience of successful solving of the psychological distress enhanced their senses of control. So they might start to response to some solvable difficulties in their lives.

Although, significant effect sizes were found in social support received from family and friends, this difference does not mean that groups of EFT and NET have received more support at the three follow-ups. Contrariwise, the social support becomes less than the pre-test (Table 2). The participants in experimental groups of EFT and NET reported a similar level of social support received from family, friends and GO-NGO at the post tests. Importantly, this could support that the reductions in PTSD and anxiety and depression symptoms, as well as the changes in coping strategies, are due to use of the interventions.

Furthermore, having the skills to solve problems and having positive thoughts may help the participants to overcome their symptoms, to be healthier and give those more of an ability to deal with future incidents. At the same line, the approaches of the interventions that were used offered the participants psycho-educational information about the normality of feelings following a traumatic event and that could help them to understand the problem that they had.

The current study indicated that both EFT and NET have effectiveness at reducing PTSD and anxiety and depression with male secondary school students, but that, not means this effective exclusive for males. These therapies could be effective with females

as well and might help traumatised people in Iraq with different ages. Further research is needed in order to investigate the mechanisms and components of these interventions.

This study has several implications. Traumatized people in Iraqi, whether are students or others, have not received psychosocial support due to the lack of mental health care in Iraq and because of cultural issues. The implication of this finding could suggest establishing PTSD centres across Baghdad city and offer these therapies for traumatized people.

Another implication can be noticed in this study through the change in coping strategies that was found and associated with a reduction in the severity level of PTSD; this could be useful for those who work with traumatized people to help them to develop problem-focused coping strategies.

Limitations

This study has several limitations. First, the results of this study were based on data collected from male secondary school students in Baghdad, so the sampling method used was not representative of the all Iraqi secondary schools in Baghdad. Second, the sample size was not sufficient to generalize the results. Because of the difficulties in obtaining permission to conduct this study on females, all the participants were male. Third, due to practical and resource constraints data collection was based on self-report scales rather than conducting clinical interviews. This is for several reasons, including the security situation and unavailability of time to travel to Iraq.

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